

## CLAIMS

- 1    1. A method for allowing a router to efficiently determine a capability and configuration  
2    of a peer router in a computer network, the method comprising the steps of:  
3        automatically determining which capability mode of operation the peer router  
4    supports by sending an initial message from the router to the peer router, the initial mes-  
5    sage including a first predetermined value of the capability;  
6        if the router receives a positive acknowledgement of the initial message from the  
7    peer router, determining that the peer router supports exchanges of messages using a new  
8    capability mode of operation;  
9        if the router receives a negative acknowledgement of the initial message from the  
10   peer router, deciding that the peer router does not support the new capability mode of op-  
11   eration; and  
12        switching to an old capability mode of operation by resending the initial message  
13   with a second predetermined value of the capability.
- 1    2. The method of Claim 1 wherein the step of deciding comprises the step of, if the  
2    router does not receive a response at all within a predetermined time, deciding that the  
3    peer router does not support the new capability mode of operation.
- 1    3. The method of Claim 1 wherein the initial message is Border Gateway Protocol (BGP)  
2    routing protocol message and wherein the capability is a time-to-live (TTL) parameter.
- 1    4. The method of Claim 3 wherein the new capability mode of operation is defined by  
2    BGP TTL Security Hack (BTSH).
- 1    5. The method of Claim 4 wherein the first predetermined value of the TTL parameter  
2    capability is 255.

1 6. The method of Claim 3 wherein the second predetermined value of the TTL parameter  
2 is 1.

1 7. The method of Claim 1 further comprising the steps of, in response to the router re-  
2 ceiving a negative acknowledgement of the initial message from the peer router:  
3 upgrading the peer router to the new capability mode of operation;  
4 rebooting the peer router, thereby destroying an existing session between the  
5 routers;  
6 establishing a new session by sending messages with the first predetermined value  
7 of the capability; and  
8 communicating between the routers using messages with the first predetermined  
9 value of the capability.

1 8. A system adapted to allow a router to efficiently determine a capability and configu-  
2 ration of a peer router in a computer network, the system comprising:  
3 a routing protocol process executing in the peer router and adapted to receive an  
4 initial routing protocol message sent by an initiating routing protocol process executing  
5 in the router, the initial routing protocol message including a predetermined value of  
6 the capability, the routing protocol process returning one of (i) a positive acknowle-  
7 dgement of the initial routing protocol message to the router if the peer router supports ex-  
8 changes of messages using a new capability mode of operation and (ii) a negative ac-  
9 knowledgement of the initial routing protocol message if the peer router does not support  
10 the new capability mode of operation.

1 9. The system of Claim 8 wherein the routing protocol process executing in the peer  
2 router is the Border Gateway Protocol version 4 (BGP) routing protocol and wherein the  
3 capability is a time-to-live (TTL) parameter.

1 10. The system of Claim 9 wherein the new capability mode of operation is defined by  
2 BGP TTL Security Hack (BTSH).

1 11. The system of Claim 10 wherein the predetermined value of the TTL parameter ca-  
2 pability is 255.

1 12. Apparatus adapted to allow a router to efficiently determine a capability and configu-  
2 ration of a peer router in a computer network, the apparatus comprising:

3 means for sending an initial message from the router to the peer router, the initial  
4 message including a first predetermined value of the capability;

5 if the router receives a positive acknowledgement of the initial message from the  
6 peer router, means for determining that the peer router supports exchanges of messages  
7 using a new capability mode of operation;

8 if the router receives a negative acknowledgement of the initial message from the  
9 peer router, means for deciding that the peer router does not support the new capability  
10 mode of operation; and

11 means for switching to an old capability mode of operation by resending the ini-  
12 tial message with a second predetermined value of the capability.

1 13. The apparatus of Claim 12 wherein the means for deciding comprises, if the router  
2 does not receive a response at all within a predetermined time, means for deciding that  
3 the peer router does not support the new capability mode of operation.

1 14. The apparatus of Claim 12 wherein the initial message is Border Gateway Protocol  
2 (BGP) routing protocol message, the capability is a time-to-live (TTL) parameter and the  
3 new capability mode of operation is defined by BGP TTL Security Hack (BTSH).

1 15. The apparatus of Claim 12 further comprising, in response to the router receiving a  
2 negative acknowledgement of the initial message from the peer router:

3 means for upgrading the peer router to the new capability mode of operation;  
4 means for destroying an existing session between the routers;  
5 means for sending messages with the first predetermined value of the capability;  
6 and  
7 means for communicating between the routers using messages with the first pre-  
8 determined value of the capability.

1 16. A computer readable medium containing executable program instructions for allow-  
2 ing a router to efficiently determine a capability and configuration of a peer router in a  
3 computer network, the executable program instructions comprising program instructions  
4 for:

5 automatically determining which capability mode of operation the peer router  
6 supports by sending an initial message from the router to the peer router, the initial mes-  
7 sage including a first predetermined value of the capability;

8 if the router receives a positive acknowledgement of the initial message from the  
9 peer router, determining that the peer router supports exchanges of messages using a new  
10 capability mode of operation;

11 if the router receives a negative acknowledgement of the initial message from the  
12 peer router, deciding that the peer router does not support the new capability mode of op-  
13 eration; and

14 switching to an old capability mode of operation by resending the initial message  
15 with a second predetermined value of the capability.

1 17. The computer readable medium of Claim 16 wherein the program instruction for de-  
2 ciding comprises one or more program instructions for, if the router does not receive a  
3 response at all within a predetermined time, deciding that the peer router does not support  
4 the new capability mode of operation.

- 1 18. The computer readable medium of Claim 16 wherein the initial message is Border  
2 Gateway Protocol (BGP) routing protocol message and wherein the capability is a time-  
3 to-live (TTL) parameter.
- 1 19. The computer readable medium of Claim 18 wherein the new capability mode of op-  
2 eration is defined by BGP TTL Security Hack (BTSH).
- 1 20. The computer readable medium of Claim 16 further comprising program instructions  
2 for, in response to the router receiving a negative acknowledgement of the initial message  
3 from the peer router:  
4       upgrading the peer router to the new capability mode of operation;  
5       destroying an existing session between the routers;  
6       sending messages with the first predetermined value of the capability; and  
7       communicating between the routers using messages with the first predetermined  
8 value of the capability.
- 1 21. A system adapted to allow a router to efficiently determine a capability and configu-  
2 ration of a peer router in a computer network, the system comprising:  
3       an initiating routing protocol process executing in the router and adapted to send  
4 an initial routing protocol message to a routing protocol process executing in the peer  
5 router, the initial routing protocol message including a predetermined value of the ca-  
6 pability, the initiating routing protocol process receiving one of (i) a positive acknow-  
7 ledgement of the initial routing protocol message if the peer router supports exchanges of  
8 messages using a new capability mode of operation and (ii) a negative acknowledgement  
9 of the initial routing protocol message if the peer router does not support the new capa-  
10 bility mode of operation.

1 22. The system of Claim 21 wherein the initiating routing protocol process executing in  
2 the router is the Border Gateway Protocol version 4 (BGP) routing protocol and wherein  
3 the capability is a time-to-live (TTL) parameter.

1 23. The system of Claim 22 wherein the new capability mode of operation is defined by  
2 BGP TTL Security Hack (BTSH).

1 24. The system of Claim 23 wherein the predetermined value of the TTL parameter ca-  
2 pability is 255.